The Mushroom-Tree Connection
Barbara Bennett

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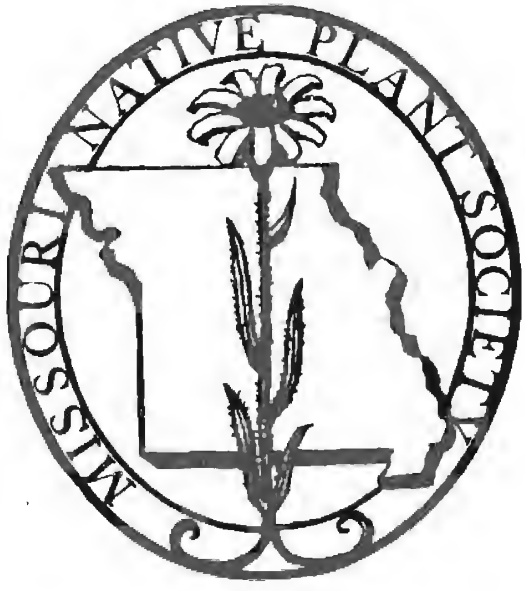

JOURNAL OF THE

MISSOURI NATIVE PLANT SOCIETY

Missouriensis is the official publication of the Missouri Native Plant Society. Founded in 1979 as a non-profit corporation, the Society is devoted to the conservation and study of the plants growing wild in Missouri, to the education of the public about the significance of the native flora and its habitat, and to the publication of related information.

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Letter from the President

We have experienced several changes in leadership of the Missouri Native Plant Society since our last meeting in the Spring.

An expression of appreciation is extended to Dr. Paul Redfearn for the exceptionally fine leadership exemplified during the past two years he has served as our President, and we hope to benefit from his continued guidance.

Compliments are also in order to our past Editor of MISSOURIENSIS, Erna Eisendrath, for dedicating long hours toward establishing a very fine publication for communicating our knowledge of the plants of Missouri. She was ably assisted by Joanna Turner and Rebecca Haefner, as well as the Editorial and Review Committees. We have noted the change in format of MISSOURIENSIS and look forward to the new issues prepared by new Editors, Nancy Morin and Marie Uehling.

We thank Diana James and Kenton Olson for serving on the Board of Directors, and welcome John Molyneaux as our newly elected Board Member, as well as John Doggett, who has consented to complete the term of Diana James. Wallace Weber will continue for another three-year term and we are indebted to him for his editorial work on the Missouri Botanical Record. Wallace has been assisted in this work by the Associate Editor, Douglas Ladd, and Jay Raveill.

Even though we missed the June meeting date, for which your new President humbly offers sincere apology, we are now able to move ahead to meet the planned objectives of the Society: the conservation and study of the plants growing wild in Missouri, the education of the public about the significance of the native flora and its habitat, and to the publication of related information.

-Melvin L. Conrad
President

Minutes of the Board Meeting

MISSOURI NATIVE PLANT SOCIETY
Friday, October 7, 1983
Cuivre River State Park

ATTENDANCE. Board Members present: John Molyneaux, Joanna Turner, Wallace Weber, Jim Henry Wilson, Ginny Wallace, Paul Nelson, Treasurer John Karel, Vice-President Nancy Morin, President Melvin L. Conrad, Secretary Jean Webdell.

Other members and visitors present: Mrs. Otto Ohmart, Mr. and Mrs. Paul Biesterfeldt, Bruce Schutte, Alta Foster, Marie Uehling, Sylvia Hein, Edgar Denison, Jean Freiling, Marilyn Scott, Neil E. Scott, Mervin Wallace, Bill Gant, Jay Raveill, Karen S. Haller, Patrick DeLozier, Linda Ellis, Doris Epstein, Erna R. Eisendrath, Pat Grace, Mary Lehmann, Jeannie Bain, Betty McCoy, Chad McCoy, Mary Susan Taylor, Sandra Posen, Ann Ruger, Dick Russell, Susan Russell, and Art Christ.

The meeting was called to order by President Melvin Conrad. Mr. Paul Nelson and Mr. John Karel of the Missouri Department of Natural Resources welcomed members to Cuivre River. Members then introduced themselves.

Special thanks was given to Erna R. Eisendrath, former editor of MISSOURIENSIS, for her excellent publication.

Minutes of the Spring Meeting were approved as read by the new secretary. (However, one minor correction was noted later - Joanna Turner should have been listed as a Board Member.)

TREASURER'S REPORT. The Treasurer's report was submitted by Treasurer John Karel, showing a balance on October 7, 1983 of $2,999.11. Income from membership dues and the sale of patches and decals was $458.85. Expenditures were $553.90 with $528.11 paid to the North American Prairie Conference. This expenditure is believed to be for expenses connected with the publication of MISSOURIENSIS. The Treasurer's report was approved with the understanding that clarification will be forthcoming as to the exact nature of the payment to the North American Prairie Conference.

MEMBERSHIP REPORT. Membership chairman Jim Henry Wilson reported 378 names on the membership list in September. He reintroduced the concept of sending out dues notices on an annual basis at one time. A discussion followed on the merits of this idea -- whether it is better to send out notices as the membership falls due, or having reduced rates for joining in mid-year. In order to begin sending the collective dues notice, leeway would be given for those who joined MONPS recently.

In rechecking the old minutes, it was found that Treasurer John Karel was to follow-up on the topic. It was the consensus that John Karel and Jim Henry Wilson would meet to set up a procedure for mailing out membership notices.

It was suggested that a questionnaire soliciting input from the members be included in the renewal notice. Pertinent information, such as upcoming events, a list of the officers, etc., could also be included.

Jim Henry Wilson also requested that he now be relieved of his indefinite term as Chairman of the Membership Committee.

MISSOURIENSIS. A discussion arose concerning the content of MISSOURIENSIS. It was suggested that more articles of general interest be included and that a state-wide calendar of events could be published.

Co-editors Marie Uehling and Nancy Morin requested articles for future issues. They announced that in the upcoming issue there would be an article to inform people of updated herbarium listings and a directory of members by area. It was noted that at one time the concept of MISSOURIENSIS was to be a professional magazine. The Co-editors asked for more input as to types of articles and the format that MISSOURIENSIS should have in the future.

Missed back issues can be requested from Wallace R. Weber, Southeast Mo. State University, Springfield, MO 63802.

INVENTORY COMMITTEE. Wallace Weber reported that he has a backlog of material to be placed into a new computer program. Some of the information has been compiled with the help of Jay Raveill.

Committee Chairman Paul Nelson reported that the Committee is working on guidelines for collection and reference people for collectors to contact. He announced that he would like to be replaced as Chairman of the Inventory Committee and suggested that Jay Raveill be considered as his replacement.

LEGISLATION. Ginny Wallace reported that there is pending legislation to protect rare and endangered species, providing for stricter and easier prosecution. Members of MONPS were encouraged to write to their legislators to support passage of this bill. In addition, a copy is to be given to Mr. Bill Dierker, Chairman of the Environmental Action Committee, for possible collective action by MONPS.

BOARD MEETINGS. It was decided that Board Meetings should continue on a quarterly basis with programs run in conjunction with the meetings.

The January meeting is set for: Sat., 14 January 1984, 10:00 a.m.
Dept. of Conservation Headquarters
2901 North Ten Mile Drive
Jefferson City, MO
Phone: (314) 751-4115

The Spring Meeting will be held in conjunction with the Missouri Academy of Science Meeting at Cape Girardeau. This meeting will be held the last Saturday of April (the 28th). More information will follow.

Diana James resigned from the Board of Directors. President Conrad recommended Mr. John Doggett, 1002 N. Mail, Sikeston, MO 63801, phone (314) 471-0396 or (314) 471-0114, be approved for a term on the Board. This was approved by members present.

ADJOURNMENT. All busines completed, the meeting was adjourned.

MISSOURI NATIVE PLANT SOCIETY

CUIVRE RIVER STATE PARK

8 October 1983

The Board Meeting Program, held Saturday at Camp Dericotte in the Cuivre River State Park, was opened by Dr. Melvin Conrad. Mr John Karel welcomed MONPS members and visitors, and commented briefly on the history of the park, which the State acquired from the Federal Government in 1945. The Park Superintendent, Mr. Don Pfiffer, and Park Naturalist Bruce Schuette expressed their delight in hosting the meeting, and encouraged all MONPS members to visit the park in the future.

Mr. Steve Orzell gave a slide show and lecture concerning fens in southeastern Missouri. Steve has studied the Salem Plateau, while developing methods to locate fens, catalog their flora, and find rare and endangered species. Fens are defined as spring-fed swampy meadow communities of relatively firm, well-decomposed peat or gravelly marl that are constantly saturated by cold calcareous water, which support a distinct calciphilous flora. Utilizing such methods as plane spotting, local resident interviews, foot surveys, and perusal of aerial photos, quadrangle maps, and herbarium records, Steve found that most fens were located in somewhat narrow, irregularly-shaped valleys containing a permanent water source and surrounded by steep slopes. As a result of his research, 166 fens have been located, 28 of which qualify as natural areas. 70 new locations for rare and endangered taxa were found. Details of Steve's project appear in Missouriensis 4(4).

A short workshop on plant collecting for the Missouri flora was led by Dr. Conrad. Some discussion centered on the need for vouchers versus conservation concerns. Collectors were instructed to collect in such a way as to not harm the plant population. People were encouraged to study a local area, especially seasonally over a length of time.

The Savannahs of Missouri State Parks were discussed by Mr. Paul Nelson. Slides and maps were shown to illustrate pre-settlement landscape patterns. A savannah consists of a forest of generally stunted and gnarly trees which are open-grown, with limbs spreading sideways, little or no understory of shrubs, and a predominantly prairie-flora groundcover. At one time one-third of Missouri contained savannahs which were naturally maintained by periodic forest fires and the impact of grazing animals such as elk and buffalo. Fire-fighting practices over the last 100 years have almost destroyed the savannahs by encouraging the growth of shrubs and invasive vegetation which suppress the native herbaceous flora. Paul was very enthusiastic about the instigation of a controlled-burn program at 27 sites on state park land. Before and after slides very clearly illustrated the benefits of the program, which will preserve the remnants of Missouri's savannah lands. With restoration and maintenance of sites, and interpretation and education of the public, Missouri will not lose this valuable resource.

Cuivre River is the third largest State Park in Missouri, according to Bruce Schuette, Park Naturalist. Bruce has recently instigated a floristic study of the park, which contains three natural areas for the protection of the flora and fauna. The park also has two large wild areas with wilderness qualities, a system of special ecological areas to protect rare and endangered plants, and a system of special ecological management areas to maintain particular plant communities. The park is located in the Lincoln Hills, which have some characteristics of glaciated plains but have the same basic bedrock types as the Ozarks. Many animal disjuncts are here, plus a high variety of natural features and transition Prairie/Ozark elements. Bruce estimates the park flora to be around 650 taxa, including several rare and endangered species.

After a break for lunch, the group split up for two field trips. Paul Nelson led his field trip to several sites within the park, including an area being returned to it's original savannah state and an area assumed to be uncut for more than a century. Bruce Schuette took the second group to a Prairie trail loop, where prairie grasses made a nice display, along with Liatris pycnocephala, Pycnanthemum tenuifolium, Eryngium yuccifolium, Solidago, Eupatorium, and several species of Lespedeza. Ophioglossum was observed in a moist woodland near the amphitheatre. Erigeron, Aster, and Solidago were still blooming along Frenchman's Bluff. And a population of the diminuative Pilwort, Pilularia americana, a new state record, was explored.

All in all, it was a highly enjoyable and successful meeting.

Photograph by Sylvia Hein

MISSOURI'S INTERESTING FLORA: *Hydrolea ovata*

Art Christ[1]

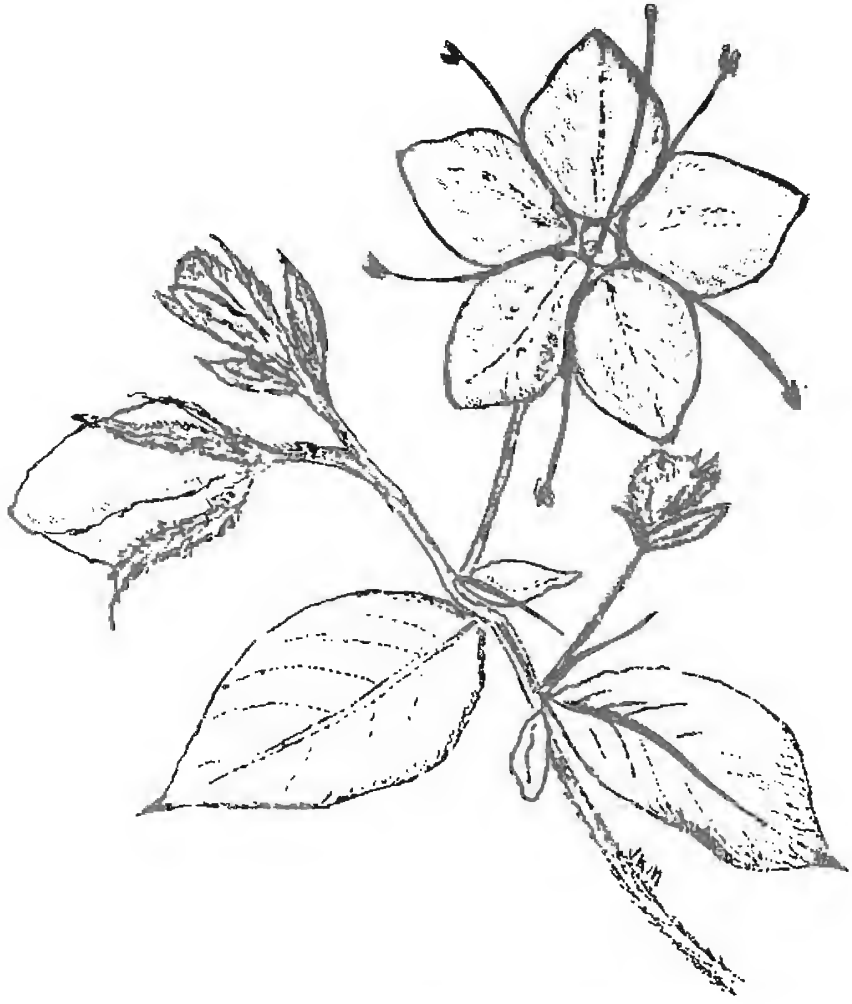
Hydrolea ovata Nuttall ex Choisy has showy blue flowers, but unfortunately it is very rare in Missouri. It was found in Missouri in Dunklin and Butler Counties in 1893 and in Howell County in 1949. Father James Sullivan and I first found this species near Neelyville in Butler County on August 10, 1972. We have since found it in the same general area as recently as 1979. It was flowering in roadside depressions and the many plants were covered with the blue broadly bell-shaped flowers.

The stems of *Hydrolea* are erect or nearly so, and are usually branched near the summit. The plants are up to a meter tall. The upper half of the stems and the midribs of the lower surface of the leaves are densely hairy. The lower leaves have short petioles, while the upper leaves are almost sessile. The leaves are ovate-lanceolate to ovate in shape, and are from two to six centimeters long and from one to three centimeters wide. Most of the leaves have spines in their axils. The flowers are in terminal panicles of cymes with 5-cleft corollas that are twelve to fifteen millimeters long. The conspicuous styles have two branches that are eight to ten millimeters long. The sepals are lanceolate to linear-lanceolate and are eight to ten millimeters long.

Hydrolea ovata Nuttall ex Choisy grows in swamps and bayous from Georgia to Texas, north to southeast Missouri. It flowers between June and September. There is another species of *Hydrolea* that can be found in southeast Missouri, *Hydrolea uniflora* Raf., but this species is more common than *Hydrolea ovata* Nuttall ex Choisy.

Hydrolea belongs to Hydrophyllaceae (Waterleaf Family). The generic name "Hydrolea" is unexplained, but doubtless in part from the Greek "hydro," "water," in allusion to the aquatic habitat. The specific name "ovata" means "egg-shaped."

[1]3458A Watson Road, St. Louis, Missouri 63139



Hydrolea ovata Nutt. ex Choisy

Missouri's Limestone Glades and Virginia's Shale Barrens: A Layman's Quick Comparison

Larry R. Morrison[1]

As a new midwesterner who is also interested in native wildflowers, I have been fascinated by Missouri's limestone glades. Strictly from a non-specialist's point of view, I have also noticed an interesting parallel between the wildflower species found on these glades and those found on the shale barrens of Virginia.

The shale barrens of western Virginia and eastern West Virginia are found on the eastward-facing slopes of the Appalachian Mountains. In this area, the wind blows predominantly from the west, so most of the moisture contained in rain clouds is squeezed from the clouds by the higher mountains before those clouds reach the eastern side; thus there is little moisture left to deposit on the eastern-facing slopes. Furthermore, these slopes are steep, composed primarily of shale, and layered like the shingles on a roof so that there is little water penetration. This area also gets a lot of sunshine, and has high spring-summer temperatures so that evaporation is rapid.

If you are familiar with Missouri's glades (also called "barrens" by a few people), you can see some immediate similarities. Both have thin soil that has poor surface water holding capacity. In both areas there is usually abundant spring rain but by mid-summer the soil is quite dry. Lacking larger plants to provide shade, both areas are rather hot and dry. Only a restricted number of plant species can tolerate the conditions resulting from these environmental factors.

Because the two environments are similar, it is not surprising that they have developed similar plant communities. I have been especially impressed with the parallels in native wildflower species. Perhaps the most distinctive genus found in each environment is its endemic leather flower: in Missouri--Fremont's (Clematis fremontii Wats.), and in the Virginias--Addison's (C. addisonii Vail.), Dwarf (C. albicoma Wherry), or Hairy Yellow (C. ochroleuca Art.), depending on the area. Each has its own distinctive evening primrose: Missouri Evening Primrose (Oenothera missouriensis Sims.), Shale Barren Evening Primrose (O. argillicola Mack.); and stonecrop--Widow's Cross (Sedum pulchellum Michx.) on the glades, Shale Stonecrop (S. telephioides L.) on the barrens. Other parallel species abound, sometimes the identical species, other times merely a similar one: spiderworts (Tradescantia ohiensis Raf., T. virginiana L.); milkweeds (Asclepias viridis Walt., A. tuberosa L.); spurges (Euphorbias); prickly pears (Opuntias); sandworts (Arenarias); wild onions (Alliums). Each also has species of Draba, Galium, Houstonia,

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and Saxifraga. There is even a shale barren in Montgomery County, Virginia that has what is, apparently, a naturally occurring population of Purple Coneflower (Echinacea purpurea (L.) Moench.), a common plant on the glades, but one which is rare in Virginia.

Of course, each location has several plant species that have no comparable representative in the other area. Kate's Mountain Clover (Trifolium virginicum Small), Shale Barren Ragwort (Senecio antennariifolius Britton), Wild Pink and Carolina Pink (Silene pensylvanica Michx., S. caroliniana Walt.), and Yellow Buckwheat (Eriogonum alleni Wats.) are some of the shale barren plants that have no corresponding species on the glade. For the reverse, glade species with no Virginia counterpart are Celestial Lily (Nemastylis geminiflora Nutt.), Purple Prairie Clover (Petalostemum purpureum (Vent.) Rydb.), Western Wallflower (Erysimum capitatum (Dougl.) Greene) Prairie Turnip (Psoralea esculenta Pursh.), Ground Plum (Astragalus mexicanus A. DC.). Despite such differences, however, when examined as a whole, the native wildflower species found in both areas are noticeably similar.

Clearly these comparisons come from the quick observations of an amateur botanist who has had only one year's experience on just a few glades. Undoubtedly, I have missed several wildflower species that can be found there. Perhaps a more detailed examination by a professional botanist would discover even more similarities between these two unusual botanical areas. It would make an interesting study.

An Earlier Record of Aira caryophyllea

Robert W. Freckmann[1]

In a recent issue of Missouriensis David Castaner (1983) reported the apparent first record of Aira caryophyllea L. (Silver Hairgrass) for Missouri. The plant was collected in Taney County on 25 June 1979. This report reminded me of a collection I had made of this species on 20 May 1976 from Wayne County in a campground along County highway HH, 1.5 miles east of the dam on Clearwater Lake. This grass was abundant in a dry, disturbed area along a trail and at the edge of a sandy road, growing with Festuca octoflora Walt. (Six-weeks Fescue) and Hordeum pusillum Nutt. (Little Barley). A voucher specimen, Freckmann 12497, is deposited in the herbarium of the University of Wisconsin-Stevens Point.

Literature Cited

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[1]Department of Biology, University of Wisconsin-Stevens Point, Stevens Point, Wisconsin 54481

WHAT'S NEW IN MISSOURI?

Jay Raveill* and Sue Taylor**

Many new species have been reported for the state since the publication of our standard reference (Steyermark, 1963). These reports have appeared in many different references over a twenty year period and are quite time consuming to locate. To help make this information available to all MONPS members, such reports will be cited in this and subsequent issues of Missouriensis.

The literature citation in the following species list is not necessarily the earliest report of a species presence in the state, but it does show its occurence. To simplify the handling of additional county records for species not in the main text of Steyermark, a dotted county map is provided for each species reported here. The map number continues the sequence from Steyermark's Flora.

Aeschynomene indica L. Dunn 1982: 97; Dunn & Knauer 1975: 27; Rudd 1955.
Aira caryophyllea L. Dunn 1982: 95; Castaner 1983: 112.
Alliaria officinalis Andrz. Nightingale 1980: 26; Mohlenbrock 1980: 14; Henderson 1980: 37.
Alyssum alyssoides L. Henderson 1980: 39.
Artemisia absinthium L. Steyermark 1963(Supplement): 1653.
Asclepias subverticillata (Gray) Vail Mühlenbach 1969: 169.
Atriplex heterosperma Bunge Mühlenbach 1969: 166.
Atriplex truncata (Torrey) Gray Mühlenbach 1969: 165.
Aubrieta deltoidea (L.) DC. Dunn 1982: 96.

Bothriochloa bladhii (Retz) S.T. Blake Dunn 1982: 95.
Bromus arvensis L. Mühlenbach 1983: 171.
Brunnera macrophylla (Adams) I.M. Jtn. Dunn 1982: 96.

Centaurea diffusa Lam. Steyermark 1963(Supplement): 1654.
Ceratostigma plumbaginoides Bunge Dunn 1982: 96.
Chenopodium watsoni A. Nels. Mühlenbach 1969: 165.
Coreopsis cardaminefolia (DC.) T. & G. Steyermark 1963(Supplement): 1653.
Crepis tinctorum L. Steyermark 1963(Supplement): 1654.
Croton lindheimerianus Scheele Mühlenbach 1969: 167.
Cucumis sativus L. Mühlenbach 1969: 170.
Cynosurus echinatus L. Steyermark 1963(Supplement): 1652.
Cyperus albomarginatus Mart. & Schrader Dunn & Knauer 1975: 27.

Desmodium strictum (Pursh) DC. Dunn 1982: 95.
Dipsacus laciniatus L. Dunn 1982: 96; Henderson 1980: 69; Weber & Ladd 1983: 97.

Eragrostis oxylepis (Torr.) Torr. Mühlenbach 1969: 163.
Erodium texanum Gray Steyermark 1963(Supplement): 1652.
Eupatorium capillifolium (Lam.) Small Steyermark 1963(Supplement): 1653.

Fimbristylis miliacea (L.) Vahl. Dunn & Knauer 1975: 27.
Fumaria officinalis L. Henderson 1980: 37.

Gaura sinuata Nutt. ex Ser. Mühlenbach 1969: 168.
Geum virginianum L. Solecki 1983: 54.
Gossypium herbaceum L. Steyermark 1963(Supplement): 1652.
Gutierrezia texana (DC.) T. & G. Steyermark 1963(Supplement): 1653.

Ipomoea amnicola Morong Steyermark 1963(1968 Errata): 1727.
Ipomoea cairica (L.) House Steyermark 1963(Supplement): 1653.

Juncus gerardi Loisel Mühlenbach 1969: 164.

Lepidium latifolium L. Henderson 1980: 38.
Lonicera maackii Maxim Mühlenbach 1983: 172.
Lonicera xylosteum L. Steyermark 1963(Supplement): 1653.
Lychnis coronaria (L.) Desr. Dunn 1982: 96.

Mentzelia albescens (Gill.) Griseb. Steyermark 1963(Supplement): 1653.

Oenothera heterophylla Spach subsp. heterophylla Mühlenbach 1983: 172.
Ophioglossum crotalophoroides Walt. Thomas et al. 1974: 120.
Ophioglossum petiolatum Hooker Thomas et al. 1974: 120.

Paspalum urvillei Steud. Steyermark 1963(Supplement): 1652.
Pennisetum ciliare (L.) Link. Steyermark 1963(Supplement): 1652.
Philadelphus coronarius L. Mühlenbach 1969: 166.
Physalis acutifolia (Miers) Sandw. Mühlenbach 1969: 170.
Physalis alkekengi L. Dunn 1982: 96.
Prunus armeniaca L. Mühlenbach 1969: 167.

Ratibida texana (James) Barnhart Steyermark 1963(Supplement): 1653.
Reseda lutea L. Mühlenbach 1983: 172.

Salsola collina Pall. Mühlenbach 1969: 166.
Sclerochloa dura (L.) Beauv. Ladd 1983: 7.
Senecio ampullaceus Hook. Steyermark 1963(Supplement): 1654.

Thelesperma ambiguum Gray Steyermark 1963(Supplement): 1653.

Verbena halei Small Mühlenbach 1969: 169.
Veronica chamaedrys L. Dunn 1982: 96.
Veronica hederifolia L. Dunn 1982: 95; Key 1980: 14.
Veronica latifolia L. Castaner 1982: 49.
Veronica persica Poir. Dunn 1982: 95; Castaner 1982: 49.

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Nightingale, Alice. 1981. New State and County Records. Missouriensis 2(3): 4-5.

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Rudd, V.E. 1955. The American Species of Aeschynomene. United States National Herbarium, Contr. 3: 1-172.

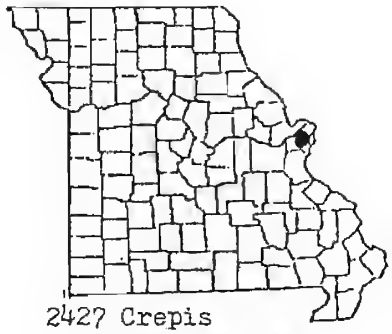
Solecki, Mary K. 1983. Vascular Plant Communities and Noteworthy Taxa of Hawn State Park, Ste. Genevieve County, Missouri. Castanea 48(1): 50-55.

Steyermark, Julian A. 1963. Flora of Missouri. Iowa State, Ames, IO. 1728p

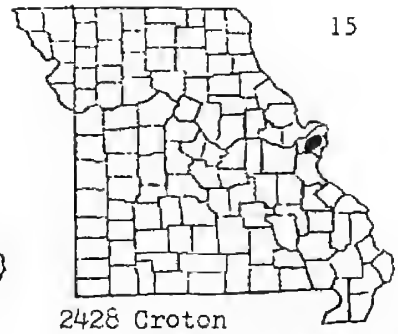
Thomas, R. Dale, et al. 1974. Two Adder's-tongue New to Missouri. American Fern Journal 64: 119-120.

Weber, Wallace R. Ñ D. Ladd, eds. 1983. Missouri Botanical Record. Missouriensis 4(3): 95-97.

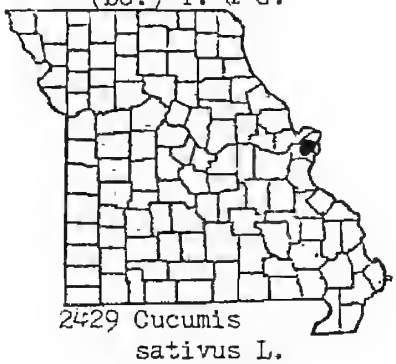
2426 Coreopsis cardaminefolia (DC.) T. & G.



2427 Crepis tinctorum L.

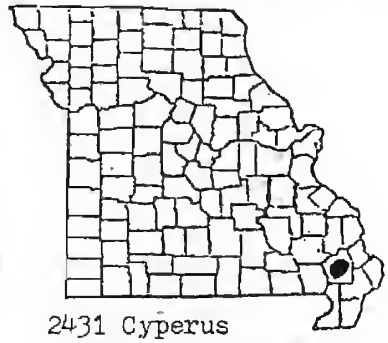


2428 Croton lindheimerianus Scheel



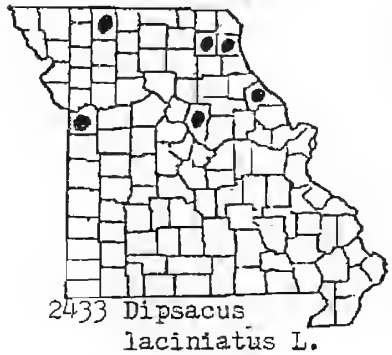
2429 Cucumis sativus L.

2430 Cynosurus echinatus L.



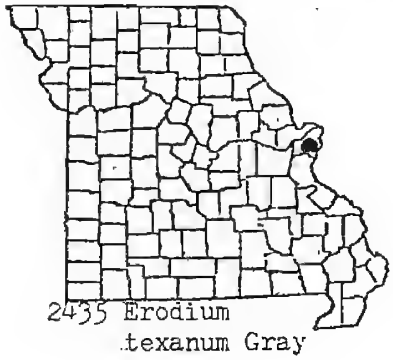
2431 Cyperus albomarginatus Mart. & Schrade.

2432 Desmodium strictum (Pursh) DC.

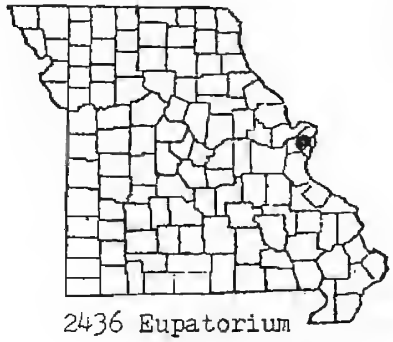


2433 Dipsacus laciniatus L.

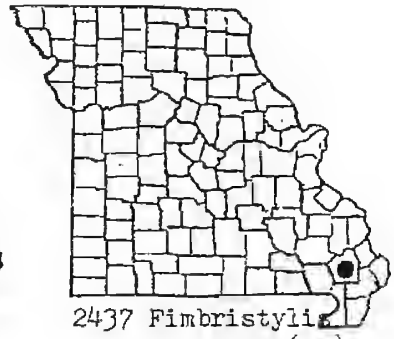
2434 Eragrostis oxylepis (Torr.)Torr.



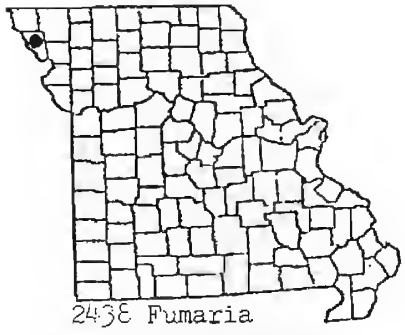
2435 Erodium texanum Gray



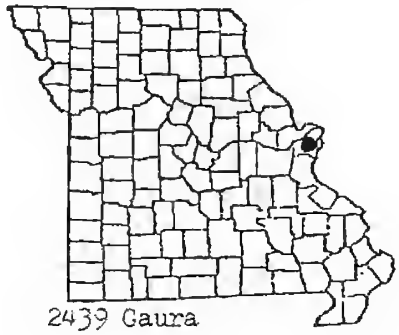
2436 Eupatorium capillifolium (Lam.) Small



2437 Fimbristylis miliacea (L.) Vahl.

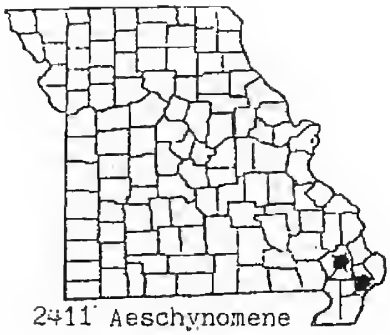


2438 Fumaria officinalis L.



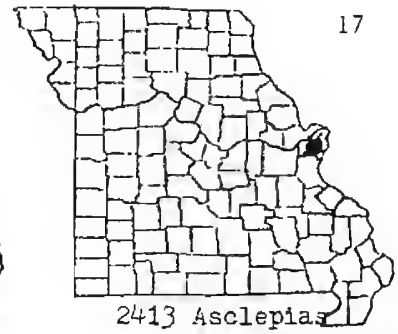
2439 Gaura sinuata Nutt. ex Ser.

2440 Geum virginianum L.



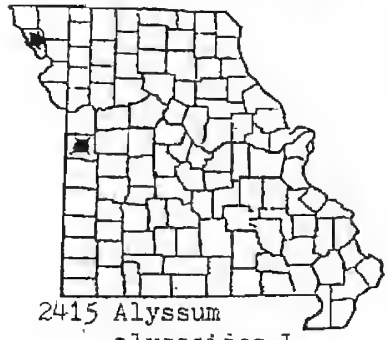
2411 Aeschynomene indica L.

2412 Aira caryophyllea L.

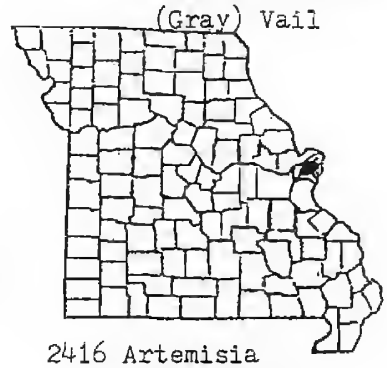


2413 Asclepias subverticillata (Gray) Vail

2414 Alliaria officinalis Andrz.

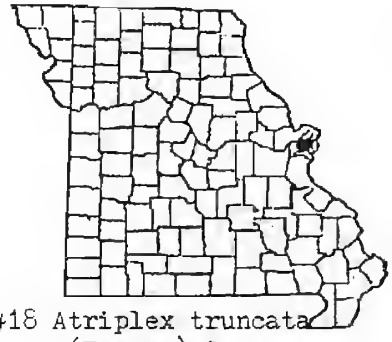


2415 Alyssum alyssoides L.

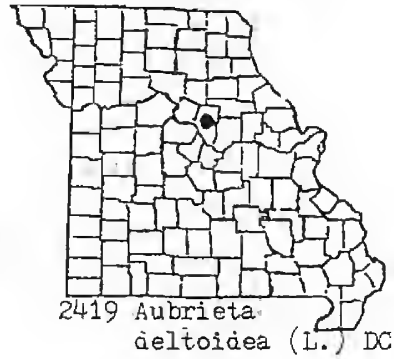


2416 Artemisia absinthium L.

2417 Atriplex heterosperma Bunge.



2418 Atriplex truncata (Torrey) Gray



2419 Aubrieta deltoidea (L.) DC.

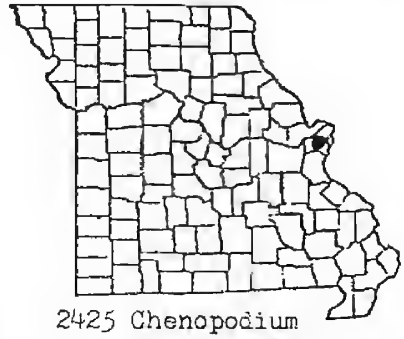
2420 Bothriochloa bladhii (Retz) S.T. Blake

2421 Bromus arvensis L.

2422 Brunnera macrophylla (Adams) I.M. Johnst.

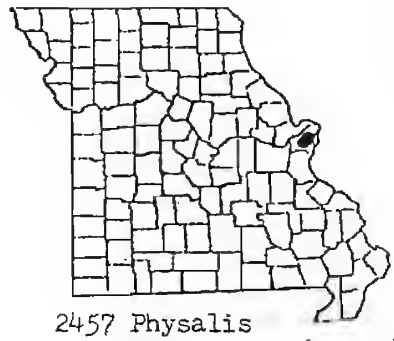
2423 Centaurea diffusa Lam.

2424 Ceratostigma plumbaginoides Bunge.

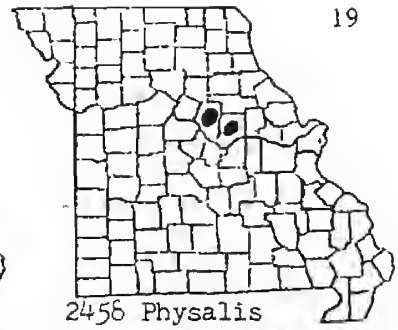


2425 Chenopodium watsoni A. Nels.

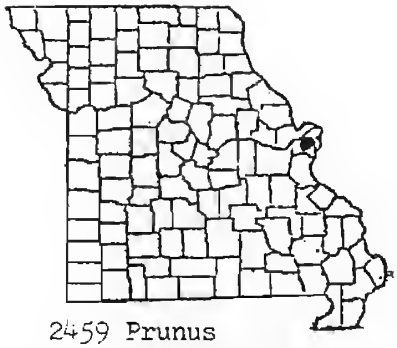
2456 Philadelphus coronarius L.



2457 Physalis acutifolia (Miers) Sandw.



2458 Physalis alkekengi L.



2459 Prunus armeniaca L.

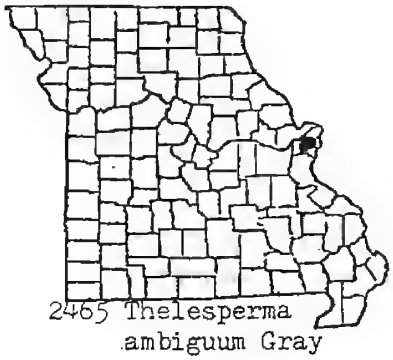
2460 Ratibida taxana (James) Barnhart

2461 Reseda lutea L.

2462 Salsola collina Pall.

2463 Sclerochloa dura (L.) Beauv.

2464 Senecio ampullaceus Hook.



2465 Thelesperma ambiguum Gray

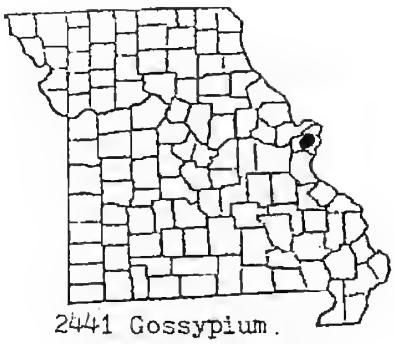
2466 Verbena halei Small

2467 Veronica chamaedrys L.

2468 Veronica hederifolia L.

2469 Veronica latifolia L.

2470 Veronica persica Poir.

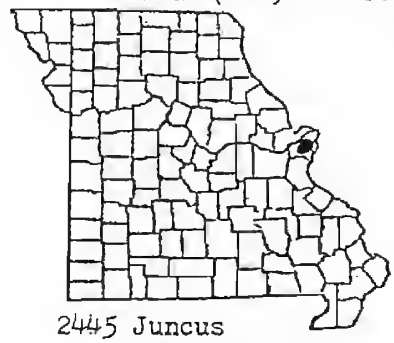


2441 Gossypium herbaceum L.

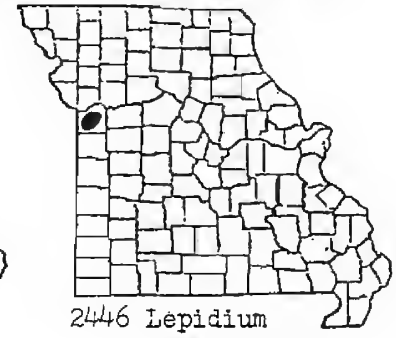
2442 Gutierrezia texana (DC.) T.& G.

2443 Ipomoea amnicola Morong.

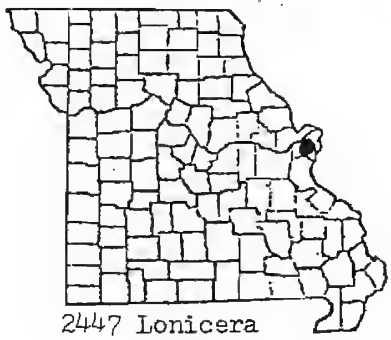
2444 Ipomoea cairica (L.) House



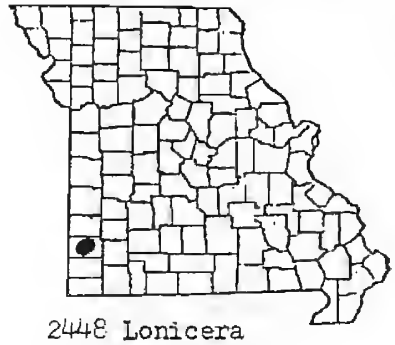
2445 Juncus gerardi Loisel.



2446 Lepidium latifolium L.



2447 Lonicera maackii Maxim.



2448 Lonicera xylosteum L.

2449 Lychnis coronaria (L.) Desr.

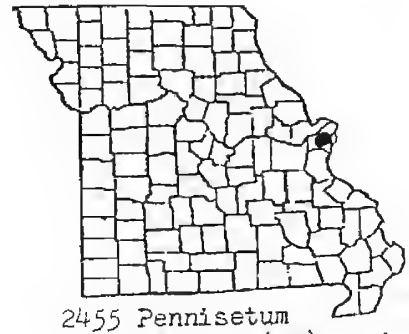
2450 Mentzelia albescens (Gill.) Greseb.

2451 Oenothera heterophylla Spach

2452 Ophioglossum crotalophoroides Walt.

2453 Ophioglossum petiolatum Hooker

2454 Paspalum urvillei Steud.



2455 Pennisetum ciliare (L.) Link.

The Mushroom - Tree Connection

Barbara Bassett[1]

Trees and mushrooms go together. If you have an eye for fungi, you have probably noticed that they tend to cluster around trees and stumps like kids around an ice cream truck.

And they're there for the same reason. Fungi are either saprophytic, parasitic, or symbiotic. Since they don't manufacture their own food, they must live off of some secondary source of organic material, and in many cases their benefactor is a tree.

Mushrooms are actually the "fruits" of a fungus. The fungus itself is simply a net of threadlike fibers, the mycelium, which grows through the fungus's substrate (soil, wood, dung, living tissue, etc.) and absorbs water and nutrients. When conditions are right, the mycelium develops mushrooms, which are its sexual reproductive structures (fungi also reproduce asexually). Spores form on or in the mushroom, and are eventually released to blow away on the wind or be carried by water, animals or insects. If a spore lands in a suitable spot, it germinates and grows into a new mycelium.

If the mushrooms you find are clustered on or around a stump, they are saprobes digesting the organic remains of a tree. Coprinus, Marasmius, and Mycena species are common small mushrooms that apear in great numbers on rotting stumps and fallen trees. The Coprini, or Inky Caps, are particularly distinctive. Their brown, striate, conical caps make them look like flocks of long-haired elves.

If the mushrooms are growing out of a living tree, especially from a wound on the trunk, they are parasitic and indicate that the tree has a fungal infection. Many bracket fungi are of this type. The Artist's Fungus (Ganoderma applanatum) causes heart rot of maple, elm, and other hardwoods. The underside of this mushroom is white but turns dark brown when scratched, and is always a delight to find when you're with small children. Another common bracket fungus in Missouri is the Cracked-Cap Polypore (Fomes rimosus), which attacks black locust.

Many fungi can live both parasitically and saprophytically, which comes in handy--when the infection finally kills the tree (or helps to kill it, which is more often the case) the fungus can live on the corpse. The Honey Mushroom (Armillariella mellea) causes a disease called shoestring root rot on many tree species, especially oaks, chestnuts, spruces, and pines. It also flourishes on the dead wood of these trees, often appearing as impressive large mushroom bouquets.

[1]Missouri Dept. of Conservation, Box 180, Jefferson City, MO 65102

You may occasionally run across the Honey Mushroom in another form. This fungus forms a network of thick, black, shoestring-like fibers, called rhizomorphs, under the bark of infected trees. These are obvious when the bark falls from rotting logs, and are found in virtually every forest. When the rhizomorphs are growing vigorously, they glow in the dark, causing the phenomenon known as foxfire.

The most delicate and intriguing relationships between fungi and trees are called mycorrhizal ("fungus-root") associations. Mycorrhizae are formed when the fungal mycelium and the tree's roots interconnect in such a way that a symbiotic relationship is established. The fungus is nourished by the tree roots and at the same time increases the tree's capacity to take up water and minerals. If you see mushrooms growing on the ground beneath a healthy living tree (especially a conifer), chances are good that they are mycorrhizal with the tree.

Mushroom hunters use their knowledge of mushroom-tree connections to locate their favorite edibles. Some fungi, especially saprobes, aren't fussy and are found in many situations, but more often a mushroom is found predictably in one type of habitat or in relationship with one or a few host species. Every Missouri mushroomer knows to look for morels near elms, cottonwoods, and apple trees (although morels, luckily, are relatively unfussy and also grow in surprising places like gardens and damp basements). The Oyster Mushroom (Pleurotus ostreatus) is often found on cottonwood and elm, Milk Mushrooms (Lactarius spp.) inhabit oak-hickory woodlands, and the much-prized Chanterelle (Cantharellus cibarius) grows under oaks and conifers.

Well-established pine plantations are excellent places to find all kinds of mushrooms. Boletes (a large complex of edible pore fungi which grow on the ground) and Amanitas (the classic poisonous "toad-stools") are two important groups of fungi which are mycorrhizal on pine and fruit in profusion during rainy fall weather.

Anyone who spends time outdoors in Missouri will see many other mushroom-tree associations. If you are interested in exploring these, be prepared for a challenge: mushrooms remain virtually unstudied in our state, and are not well known generally. Although it is far from comprehensive, the new Audubon Field Guide to North American Mushrooms is the best publication for beginning mushroomers. (I have many other books and publications, and will be happy to help out with any mushroom identification problems. Together we might be able to figure it out!)

Literature Cited

Lincoff, G. H. Audubon Field Guide to North American Mushrooms. Alfred Knopf. New York.

MISSOURI HERBARIA

Missouri Botanical Garden (MO) 3,037,000 Specimens
Botany Dept., Herbarium
PO Box 299
St. Louis, MO 63166
(314/577-5180)

Director: Dr. Peter Raven; ONAGRACEAE.
Administrative Curator: **Dr. Nancy Morin**; CAMPANULACEAE.
Curatorial Staff:
Dr. Thomas B. Croat; ARACEAE.
Dr. William G. D'Arcy; Flora of Panama; SOLANACEAE.
Dr. Gerrit Davidse; Flora of MesoAmerica; POACEAE.
Dr. John Dwyer; RUBIACEAE.
Dr. Alwyn H. Gentry; Missouri flora; Flora of Peru; BIGNONIACEAE.
Dr. Peter Hoch; ONAGRACEAE.
Dr. Viktor Mühlenbach; Missouri flora; adventive species.
Dr. Julian Steyermark; Flora of Missouri; Flora of Venezuela.
Staff:
Roy Gereau, Curatorial Assistant; Michigan flora; POACEAE.
Sue Taylor, Herbarium Assistant; California flora; PTERIDOPHYTA; bibliography.
Marie Uehling, Herbarium Assistant; Missouriensis Co-Editor.
Volunteer/Contributor:
Jay Raveill; Missouri flora.
Mary-Lynn Ricketts; Missouri-Illinois Reference Collection.
Mark Williams; Missouri-Illinois Reference Collection.

Comments: World-wide collection, emphasis on pantropics; Steyermark, Palmer, and other Missouri vouchers; separate Missouri-Illinois Reference Collection visitors welcome to use; depository for county record vouchers. Additional staff members not listed specialize in pantropical flora; complete list of personnel available on request.

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University of Missouri-Columbia (UMO) 250,000
201 Tucker Hall
Columbia, MO 65201
(314/882-6519)

Director: **Dr. David B. Dunn**; Lupinus (FABACEAE).
Staff:
Billy Cumbie; Comparative Plant Anatomy in Malvaceae and Fabaceae.
Charles S. Gowans; Phycology, Genetics, Taxonomy.
Clair Kucera; Ecology, Agrostology, POACEAE of Missouri.
Vicki Love, Herbarium Technician; plant identification for the University Extension Service.
Joseph Wood; Paleobotany, Pollen Slides, Macrofossils.
Students:
David Bogler; Lupinus ashenbornii complex (FABACEAE).
Mike Curier; project undetermined.
Becky Haefner; Sink-hole ponds of Missouri.
Beverly Roedner; rare plants on glades in southern Missouri.
Kathy Robertson; Lupinus elegans complex (FABACEAE).

Comments: Emphasis on Lupinus of the world, will determine lupins for any citizens of the state; Palmer collection of 70,000; Steyermark collection of 20,000; Dunn collection of 30,000; vouchers for the Nuclear Reactor Forest and Prairie Plots at Fulton.

****

Southwest Missouri State University (SMS) 90,000
Ozarks Regional Herbarium
Dept. Life Sciences
Springfield, MO 65802
(417/836-5882 or 836-5883)

Director: **Dr. Paul L. Redfearn;** Interior Highlands flora, BRYOPHYTA.
Staff:
Dr. Wallace Weber; Missouri flora, Channel Sandstone floristics, biology of Geocarpon minimum, flora of LaPetite Gemme Prairie.
Dr. Grant L. Pyrah; POACEAE of Missouri, studies on Leersia.
Volunteers/Contributors:
Douglas Ladd, Bennet Springs State Park Naturalist; LICHENS.

Comments: Emphasis on Interior Highlands, Missouri Ozarks, Southwest Missouri; numerous vouchers for state park and regional areas; Steyermark collection; 45,000 bryophyte collection; depository for county record vouchers.

****

University of Missouri-Kansas City 32,000
Biology Dept.
5100 Rockhill Rd.
Kansas City, MO 64100
(816/276-1385)

Director: **Dr. Norlan C. Henderson;** vascular flora of the southeastern United States (Lycopus, and IRIDACEAE); Flora of the Middle West (11 states) in progress.
Volunteers/Contributors:
Patrick DeLozier; Missouri flora.
Jay Raveill; Missouri flora.
Comments: Depository for county record vouchers.

****

Missouri Southern State College (MCJ) 27,000
Biology Dept.
Joplin, MO 64801
(417/624-8100 ext. 278)

Curator: **Dr. E. Sam Gibson;** plant taxonomy, Senecio (ASTERACEAE).
Co-Curator: Dr. James R. Jackson; physiological plant ecology.

Comments: Includes ca. 4700 L.J. Gier bryophyte collections.

****

William Jewell College (WJC) 15,000
Dept. Biology
Liberty, MO 64068
(816/781-3806 ext. 227)

Director: **Dr. Burdette L. Wagenknecht;** cultivated woody plants.

Comments: Teaching collection; specializing in local flora.

****

Northeast Missouri State University 14,000
Science Division
Kirksville, MO 63501
(816/785-4623)

Curator: **Dr. Melvin L. Conrad;** Lupinus albicaulis - L. formosus complex; bryophytes of northeastern Missouri; Missouri flora.
Science Faculty:
Max Bell; Plant Anatomy.
James E. Dimit; Ecology.
David Hanks; Mycology, Microbiology.
Gary Sells; Plant Physiology.

Comments: Emphasis on northeastern Missouri flora; former herbarium of Central Wesleyan College housed here.

****

Southeast Missouri State University 13,000
Dept. Biology
Cape Girardeau, MO 63701
(314/651-2000)

Curator: **Otto Ohmart;** Cape Girardeau County flora.

Comments: Emphasis on county flora vouchers; continental United States and Canada collections included.

****

School of the Ozarks (SOTO) 8,500
Biology Dept.
Point Lookout, MO 65726
(417/334-6411 ext. 299)

Curator: **Dr. Alice Nightingale;** White-River Ozarks flora.
Co-Curator: Dr. Kenton C. Olson; survey of fungi of the Ozarks.

Comments: Emphasis on Missouri-Arkansas White River-Ozarks region; Missouri flora county record vouchers depository.

****

Park College 5,000
Dept. Biology
Parkville, MO 64152
(816/741-2000 ext. 141)

Director/Curator: **Dr. Al Dusing;** Platte County flora.

Comments: Small teaching collection; emphasis on Platte County flora.

****

Northwest Missouri State University (NMSU) 5,000
Dept. Biology
Maryville, MO 64468
(816/562-1203)

Director: **Dr. B.D. Scott**; flora of northwestern Missouri.

Comments: Emphasis on Nodaway County, northwestern Missouri and adjacent southwestern Iowa flora.

****

Missouri Western State College (MWSJ) 5,000
Biology Dept.
St. Joseph, MO 64507
(816/271-4379)

Curator: **Dr. John Rushin**; Echinacea (ASTERACEAE) hybridization.
Co-Curator: Dr. Leo Galoway; Abronia (NYCTAGINACEAE).

Comments: Emphasis on northwestern Missouri flora; representative collection of Abronia; Dr. Galoway is retired (25 Belgrade Rd, St. Joseph, MO 64505).

****

Missouri Department of Natural Resources 1,800
Division of Parks and Historical Preservation
PO Box 176
Jefferson City, MO 65102
(314/751-2479)

Curator: **Paul Nelson**; floristic inventory of the 42 Missouri State Parks.
Staff: Park Naturalists of Cuivre River, Bennett Spring, Lake of the Ozarks, Roaring River, Thousand Hills, Prairie, Meramec, St. Francois, Babler, and Knob Noster State Parks.
Students:
Randall Clark; Rock State Park flora.
Wanda Oskins; Big Oak State Park flora.

Comments: Emphasis on rare and endangered species; state parks of Missouri flora.

****

Central Methodist College 1,500
Dept. Biology
Fayette, MO 65248
(816/248-3391 ext. 370)

Curator: **Dr. Dan Elliott**; old-field succession.

Comments: Mostly spring flowers collected by students; old-field succession vouchers; Howard County flora (possibly not seen by Steyermark).

****

Drury College 1,500
Dept. Biology
Box 19
Springfield, MO 65802
(417/865-8731 ext. 237)

Curator: **Dr. Larry Stauffer.**

****

Ozark National Scenic Riverways 1,300
National Park Service
PO Box 490
Van Buren, MO 63965
(314/323-4236)

Superintendent: **Art Sullivan.**
Chief of Interpretation: Alex Outlaw.

Comments: Collection is part of a botanical survey of the Riverway, by P.J. Redfearn, et al. 1969.

****

Penn Valley Community College 1,200
Dept. Life Sciences
3201 Southwest Trafficway
Kansas City, MO 64111
(816/756-2800 ext. 243)

Curator: **Dr. Paul M. Thomson;** Missouri FAGALES.

Comments: Mainly a reference collection of local species for use in teaching; type material of Quercus x introgressa Thomson deposited here.

****

Harris-Stowe State College 1,000
Biology Dept.
3026 Laclede
St. Louis, MO 63103
(314/533-3366 ext. 33)

Curator: **Dr. Terry F. Werner.**

****

Mark Twain National Forest 800
Ava Ranger District
Box 188
Ava, MO 65608
(417/683-4428)

Curator: **District Ranger.**

Comments: Includes some 1936-1937 Steyermark collections.

****

Lindenwood Colleges 800
Biology Dept.
St. Charles, MO 63301
(314-946-6912 ext. 233)

Curator: **Dr. Daryl Anderson.**

Comments: Teaching collection; many species from Arizona and New Mexico.

****

Hannibal-LaGrange College 637
Biology Dept.
Hannibal-LaGrange, MO 63401
(314/221-3675)

Director/Curator: **Kathy Nelson.**

Comments: Emphasis on Marion County flora, particularly areas close to the college.

****

Jefferson College 600
Biology Dept.
Hillsboro, MO 63050
(314/789-3951)

Director: **Charles Schlanker.**

Comments: Not working on the Missouri flora update.

****

Southwest Baptist College 300
Biology Dept.
Bolivar, MO 65613
(417/326-5281 ext. 342)

Curator: **Dr. Jasper A. Clark.**

Comments: Dr. Clark is retired but still works part time at the college.

****

Culver-Stockton College 300
Biology Dept.
Canton, MO 63435
(314/288-5221 ext. 40)

Curator: **John Bursewicz.**

****

Longview Community College 200
Biology Dept.
500 Longview Rd
Lee's Summit, MO 64063
(816/763-777)

Curator: **Jim Beisel**; horticulture.

****

Moberly Junior College 40-50 families
Biology Dept.
College and Rollins
Moberly, MO 65270
(816/263-4110)

Curator: **Dr. Wilbur J. Gunier.**

Comments: Several plants from along the old Katy Railroad line.

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Missouri Department of Conservation No active collection
PO Box 180
Jefferson City, MO 65102
(314/751-4115)

Director: **Larry Gale**; Wildlife Biologist.
Staff:
Sherry Morgan; status reviews of Federal Candidate species for endangered species list; population monitoring for selected endangered species.
Mary K. Taft; effects of management techniques on prairie vegetation.

Comments: The Department has responsibility for maintaining endangered species list and maintains records on rare species; includes Heritage Program which is collecting data on rare species, Natural Areas, natural communities, etc.

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MEMBER HIGHLIGHTS: Julian Steyermark

Gerrit Davidse[1]

Dr. Peter H. Raven, Director of the Missouri Botanical Garden, recently announced that Dr. Julian A. Steyermark will join the staff of the Garden as Curator in the spring of 1984. Since 1959 Steyermark has resided in Venezuela where he has been a member of the staff of the Dirección de Investigaciones Biológicas, INPARQUES (formerly Instituto Botánico). During these years, he was deeply involved in the botanical exploration of Venezuela, collecting extensively in all regions of the country -- especially in the Guayana Region in the state of Bolivar and the federal territory of Amazonas. He has published numerous papers on Venezuelan plants, including a three-volume treatment of Venezuelan Rubiaceae for the Flora de Venezuela and the beautifully illustrated, 971-page Flora del Avila co-authored with Otto Huber in 1978. Most recently he completed the manuscript of the Piperaceae for the Flora de Venezuela, a family he considers the most challenging he has ever studied. Publication is expected in the near future.

In addition to his heavy publication schedule, Steyermark continues to be one of the most active field botanists. This is perhaps demonstrated most dramatically by the fact that his collecting number has surged past 130,000 during 1983. This is undoubtedly a world record in its class and does not include separate number series that were started for specific expeditions or plants collected under other person's number series. This amazing personal feat becomes even more remarkable when it is realized that the majority of his collections in Venezuela (as well as earlier ones in Guatemala) were made in relatively inaccessible regions where much of the collecting had to be done on foot with mule trains or with Indian porters and where many of the plants to be collected were large, difficult to collect tropical trees and lianas.

Steyermark will continue to devote most of his time to work on the Venezuelan flora after his return to St. Louis. He maintains, however, a very strong interest in Missouri plants, and we hope that this interest will intensify as he is once again surrounded by the plants he began to study before all others.

Steyermark was born in St. Louis in 1909 and first developed an interest in plants as a budding, teenage artist. Many of his beautiful paintings of native wildflowers and plants cultivatd in the Garden's greenhouses were donated to the Garden's library and can be consulted in the Garden's archives. Soon after developing this artistic interest in plants, he developed professional interest as well. He obtained a B.A. and an M.S. from Washington University, St. Louis, in 1929 and 1930, respectively, an M.A. from Harvard University in 1931, and a Ph.D. from Washington University in 1933.

[1]Missouri Botanical Garden, P.O.B. 299, St. Louis, Missouri 63166

His Ph.D. dissertation was a monograph of the North American species of Grindelia (Compositae). Thereafter, he worked for one year as a research assistant to Dr. Robert E. Woodson at the Missouri Botanical Garden, and he taught high school biology at University City Senior High School from 1935 to 1937. In 1937 he joined the staff of the Field Museum in Chicago where he remained until 1959. During his time in Chicago, he collected extensively in Guatemala and co-authored eight volumes of the Flora of Guatemala with Paul C. Standley. During WW II, he explored remote areas of Ecuador and Venezuela to search for new locations and strains of quinine trees which were needed as a source for the drug to control malaria in the U.S. armed forces.

His work on the Missouri flora, begun during his teenage years in St. Louis, continued during his stay in Chicago. Most of the extensive collections he made of Missouri plants during this time were made during weekend and vacation camping trips. This work was culminated in 1963 by the publication of his widely acclaimed Flora of Missouri.

NEWS & NOTES

Dr. L. J. Gier, who was a member of the Missouri Native Plant Society, passed away on 11 July 1983 at the age of 79.

-Margaret E. Gier

Spring Meeting Planned

The spring MONPS meeting will be held on April 28th at Cape Girardeau. The breakfast Board Meeting at the Southeast Missouri State University Center will be followed by talks and a field trip to the New Madrid fault area. More details will be forthcoming in the next issue of MISSOURIENSIS.

MO-ILL Reference Collection

Jay Raveill is currently volunteering in the herbarium at the Missouri Botanical Garden. He is a recent graduate of SIU-Carbondale with a Master's Degree in taxonomic botany. One of his tasks is to help put together a Missouri-Illinois Reference Collection. Representative specimens of all the species of plants found in Missouri (from Steyermark, 1963 and updates) are being pulled and organized for the use of anyone interested in the flora.

New Position

Steve Orzell, also a recent graduate of SIU-Carbondale with a Master's in taxonomic botany and a consistent contributor to MISSOURIENSIS, has landed a new job in Arkansas. He will be with the Arkansas Natural Heritage Commission in Little Rock as the state botanist. We wish him the best of luck.

St. Louis Chapter Organized

The organizational meeting for the founding of the St. Louis Chapter of MONPS will be held on January 20, 1984, starting at 7 p.m., at the Museum Building in Missouri Botanical Garden. Notices are being sent to members in the St. Louis Metropolitan area, but all interested people are encourage to attend. Phone Sue Taylor, 577-5177 (day) or 644-1382 for details.

Note: Contributions on people, upcoming events, etc. of interest to MONPS members are welcomed by the Editors.

MEMBERSHIP APPLICATION

MISSOURI NATIVE PLANT SOCIETY

Name _____

Address _____

City/State _____ Zip _____

Enclosed is my contribution to the preservation of Missouri native plants in the amount of $ _____.

Membership Categories

Student	$ 2.00
Regular (Individual or Family)	5.00
Contributing	15.00
Sponsoring	50.00
Sustaining	100.00
Group	25.00

Mail application with contribution to:

Dr. Jim Henry Wilson
Missouri Department of Conservation
Box 180
Jefferson City, MO 65102